LAMP FOR THERAPEUTIC TREATMENTS
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5 Claims. (Cl. 128—396)

1. The present invention relates to therapeutic treatment devices and, more particularly, to lamps designed for the treatment of body parts by administering, if desired, simultaneously radiation as well as a fluid stream to said body part or body parts.

The beneficial effect of various types of radiation upon body parts suffering from certain ailments is known. It is also known that the intensity of the irradiation and the duration of the treatment required vary with the nature of the disease and that prolonged exposure of unaffected tissues to certain rays, notably in the ultraviolet range, may be harmful.

It is, therefore, an object of the present invention to provide in a therapeutic device of the aforesaid type means permitting localized treatment of a body part, whereby the full therapeutic effect of the lamp may be concentrated upon said body part.

It is another object of the invention to provide means affording treatment of certain body parts, such as the oral, nasal or aural cavity.

It is a further object of the invention to provide means facilitating supply of a stream of irradiated fluid in addition to or in lieu of direct radiation (ultra-violet and/or infra-red).

It is yet another object of the invention to provide means for supplying a stream of irradiated fluid to be charged with additional medicament useful in the treatment on a predetermined body part or parts.

It is a still further object of the invention to provide, in a therapeutic lamp, means permitting arrangement of the source of radiation in such a manner that fluid, in the form of a gas, air and the like will be exposed to radiation before said fluid is impinged upon desired locations of the body part.

It is still another object of the invention to provide, in combination with a therapeutic lamp, means ensuring variation of the area for localized treatment of body parts, such as the ear, nose or throat; more specifically, the invention contemplates adapter means detachably disposed so that treatment by means of rays or irradiated air or a combination of both, may be effected.

It is yet another object of the invention to provide, in a therapeutic apparatus, a combination of sources of different types of radiation which may be operated separately or simultaneously and to provide a control arrangement for energizing said sources during predetermined intervals which may be either successive or overlapping for different types of radiation.

The above and other objects of the invention will become apparent from the following description taken in conjunction with the accompanying drawings.

In the drawings:
Fig. 1 is a perspective view of the general organization of a therapeutic apparatus according to the invention;
Fig. 2 shows in cross section, on a larger scale, a lamp forming part of the therapeutic apparatus illustrated in Fig. 1;
Fig. 3 is a front elevation of a portion of the lamp shown in Fig. 2;
Figs. 4, 5 and 6 are fragmentary sectional views of a lamp according to the invention, illustrating various forms of adapters; and
Fig. 7 is a circuit diagram relating to the apparatus illustrated in Fig. 1.

Referring now in greater detail to the drawings and more particularly to Fig. 1, there is shown an apparatus 10 made in accordance with the invention. This apparatus has a cabinet 11 mounted on casters 12 and provided with a control panel 13; a standard 14 rising from the cabinet 11; a rod 15 slidably held in a bearing 16 which is secured to the upper end of standard 14, and a lamp 17 attached to the lower end of the rod 15. It will be seen that hollow standard 14 consists of two portions interconnected by a sleeve 18, whereby a rotation of the lamp-holding rod 15 relative to the cabinet 11 is possible. Standard 14 encloses a portion of a cable 19 which connects lamp 17 to the control cabinet 11. As shown more clearly in Fig. 2, rod 15 is provided with an extension 20 which is pivoted thereto about a screw bolt 21, the lamp 17 being formed with a holder piece 22 which is detachably secured to the extension 20 by means of a bayonet connection 23. By this arrangement, the lamp 17 may be fixed in a variety of positions relative to the cabinet 11, as required for any particular purpose.

As shown in Fig. 2, lamp 17 has a housing consisting of a socket 24 and a cover member or hood 25. The corrugated hood 25 having an inner wall with discontinuous reflector surfaces (Fig. 2) may be detachably mounted on the socket 24 by means of bayonet connections 26, 28a and is provided with a reduced center outlet 27 and a plurality of lateral outlets 25, 28a. Each outlet 27, 28, 28a comprises an annular flange 29 designed to cooperate with an adapter, such as indicated in dotted lines in Fig. 2, pre-
ferred adapter types being disclosed in Figs. 4 to 6. Suitable covers (not shown) may be employed to close any of the outlets, when not in use.

The cable 19 divides into two branches, respectively, containing the wires 31, 32 and 33 connected to a motor 38 and further the wires 34, 35, 36, 37 and 38, serving to supply electric current to a radiating unit indicated generally by numeral 39. The motor 38 is disposed in an extension 88 of socket 26 and carries a fan blade 61 mounted on motor shaft 62. Ports 63 are provided in the socket housing 24 rearwardly of blade 61, whereby air from the surrounding atmosphere may be drawn through openings 65 by the blade 61 into the socket 24 and may be propelled toward the front of the socket and through one of the outlets of hood 25, if the latter is attached to the socket.

The radiating unit 39 of Fig. 3 comprises a perforated disc-shaped plate 44 preferably of insulating material, which serves as a support for the ray-emitting elements 40, 41 and 42. The radiating elements 40, 42 have a common terminal 43 located at the center of the plate 44 and extending therefrom in interlaced spiral convolutions toward respective terminals 45 and 48. It will be seen that the elements 45 and 48 occupy the major portion of the front surface of plate 44. Radiating element 47 is of annular form and is mounted adjacent the periphery of the plate 44, its two terminals being shown at 31, 32.

The insert 56 may be secured to the socket 24 by any suitable means, such as by brackets 53. From Fig. 2 it will appear, that wire 56 is connected to the common terminal 43, and that wires 39, 27 and 28 are, respectively, connected to terminals 63, 64, 61 and 62 (Fig. 3). The cable branch containing these five wires may enter the socket 24 by way of an insulating washer 54, as shown.

In a preferred form of the invention, the element 47 is a source of infrared radiation, whereas the elements 40 and 42 are both tubes emitting ultra-violet rays, although of different intensity. Merely by way of example, it may be mentioned that element 45 may consist of a tube provided with a quartz envelope, while the other element 48 may be a tube having an envelope consisting of a vitreous filter material, such as is known under registered trade-mark "Corex."

Referring further to Fig. 7, it will be seen that the circuit arrangement shown in Fig. 7 will now be clear. The timers 57, 58 may be of any known or suitable type and serve to energize the transformers 56, 60, respectively, during predetermined intervals, thereby respectively causing the elements 45, 48 to radiate.

It will be understood that the periods of energization of elements 45 and 48, respectively, may be synchronized or alternating, or other than so desired for a particular treatment. The energization of element 47 may be effected at will through the actuation of switch 62.

It will also be understood that, with the switch 59 in a "normal" position to cause rotation of motor 38 in a predetermined direction, air irradiated from the radiating unit 39 to the other therapeutic purposes will pass through the socket 24, and if the hood 25 is attached thereto, will escape through whichever of the outlets 27, 28, 29 happens to be open. Such outlet or outlets may be provided with an adapter or applicator designed to confine the stream of irradiated air and/or the rays themselves to a particular part of the body of the person to be treated. Various forms of adapters are shown in Figs. 4, 5 and 6. The adapter of Fig. 4 consists of a straight metal tube 66 provided at one end with a head 67, this head fitting removably but tightly within the opening of sleeve 23 surrounding the outlet. This adapter may be used, for example, for the treatment of the respiratory tract which treatment involves the inhalation of irradiated air by way of mouth.

The adapter or applicator shown in Fig. 5 is specifically designed for treatments involving inhalation of irradiated air through and/or direct irradiation of the nasal passages. This adapter comprises a head 65 and a pair of tubular members 67, 68 extending forward from said head.

Provision may be made to connect to members 67, 68 inlet pipe or pipes, such as later on referred to for the supply of medicinal fluid (Fig. 6). The members 67, 68 may be partly tapered, as shown, and are spaced in such a manner that they permit convenient introduction into the nostrils of a person to be treated. For sanitary purposes, it may be desirable to provide each member 67, 68 with a detachable extension 62, 70, respectively, which may be reserved for the sole use of a particular patient and which can be either discarded or if made of suitable material conveniently sterilized on removal from the applicator.

A similar extension may, of course, be provided for the adapter of Fig. 4.

Still another form of applicator is shown in Fig. 6. A cup-shaped member 71 is inserted into the sleeve 23 and communicates, by way of a flexible tubing 72, with a similar cup-shaped member 73 having secured thereto a tubular attachment 74. The head 75 of attachment 74 may be similar in form to the cup-shaped member 71 and is press-fitted into the sleeve member 73. The tubing 72 may consist of rubber, polyvinyl chloride or other suitable natural or synthetic material, and may be screw-threaded at its ends into cups 71 and 75, as shown. It will be understood that the attachment 74 may be replaced by other forms of adapter, as shown in Figs. 4 and 5.

One of the purposes of the provision of tubing 72 is to make it possible to discontinue direct irradiation of the patient's tissues, without interrupting the flow of irradiated air through the adapter.

Thus, in the particular condition of the tubing 72 shown in Fig. 6, the patient may continue to inhale the air supplied through the hood 25 even though no rays from the radiating unit 39 will be guided through or impinged on the at-
Another purpose of the provision of this tubing is to allow for the displacement of the attachment 14 relative to the lamp 17 without necessitating a bodily displacement of the lamp 17, assuming that no direct irradiation of the patient is required. The flexible tubing 72, accordingly, represents a convenient means for varying the mode of treatment, as well as a flexible coupling between the adapter and the hood of the lamp.

As further shown in Fig. 6, there may be provided an inlet pipe 16 whereby additional medication, preferably in fluid form, may be introduced into the stream of irradiated air guided to adapter-attachment 14. The medication thus added may be in the form of a spray or a vapor, or it may be a liquid capable of being entrained in atomized condition by the stream of irradiated air. The inhalation of the additional medication will thus occur simultaneously with any or all of the other forms of treatment afforded by the apparatus according to the invention.

The attachment of any of the adapters to the center outlet 21 will have the result that substantially all the radiation passing through the adapter will be of the type radiated by the elements 45 and/or 46, since little or no rays from the outer element 47 will be able to reach the user by way of the tubular members illustrated in Figs. 4-6.

Yet if, in the embodiment illustrated, it be desired to subject a patient to treatment by infrared radiation, all that will be necessary will be to mount the proper attachment on one of the outlets 28 or 28a which are positioned adjacent the element 47 and to close the switch 62. It will further be understood that the latter switch, too, may be controlled by a timer such as 57 and 58 in Fig. 7.

It will be seen that the lamp 17 may also be used, if desired, in place of a conventional, wide-beam ultra-violet and/or infra-red radiation by removing the hood 25 and de-energizing the motor 22. On the other hand it will be appreciated that, even where the use of the source of air current through motor 30 and blade 41 is not required, the attachment of the hood 25 and the closure of the unused outlet openings 28a, 28 will purposely protect the eyes of the attendant and other persons from the rays emitted by unit 39.

It can thus be seen, that there has been provided according to this invention a therapeutic treatment plant, which essentially comprises, in combination, a socket, a radiating unit disposed in said socket, and means for localizing the therapeutic effect of the rays emitted by said unit, said means including an apertured member covering said socket and secured to the latter in front of said radiating unit.

Although the invention has been described with reference to certain specific embodiments thereof, it is to be distinctly understood that various modifications and adaptations of the arrangements herein disclosed may be made and may readily occur to persons skilled in the art without constituting a departure from the spirit and scope of the invention as defined in the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a therapeutic apparatus, in combination, a housing, a plurality of radiating elements, a perforated, substantially disc-shaped support for said elements and removably secured to said housing, respective circuit means adapted to energize said elements, whereby said elements emit different types of radiation, respectively, and closable outlet means connected to and positioned forwardly of said housing, some of said outlet means forming an angle with respect to the axis of said housing and being adapted to guide a predetermined degree of radiation to the outside of said housing.

2. In a therapeutic apparatus according to claim 1, wherein said elements include a pair of ray-emitting tubes extending in interleaved spiral convolutions from the center of said support toward the periphery thereof and substantially in one and the same plane.

3. In a therapeutic apparatus according to claim 2, wherein said elements include an additional ray-emitting tube of annular form positioned spaced from said pair of tubes and adjacent the periphery of said plate.

4. A therapeutic treatment apparatus comprising a socket housing having a horizontal axis, a transverse support positioned in said housing, tubular ray emitting means for ultra-violet radiation and infra-red radiation, respectively, arranged in circular formation on said support, said support being provided with perforations passing through said support and extending adjacent said tubular ray emitting means at predetermined radial distances from the center of said support, means mounted in said housing and positioned rearwardly of said support for moving fluid through said perforations of said support and for contact of said fluid with said ray emitting means, a hood member having an inner wall and mounted forwardly of said support to close said socket housing, a plurality of outlet means arranged in angular relation to each other on the periphery of said hood member and inclined with respect to the horizontal axis of said socket housing whereby some of said outlet means are partially impinged by said fluid and exposed to predetermined portions of said ray emitting means, and a plurality of discontinuous ray reflector surfaces arranged on the inner wall of said hood member.

5. An apparatus according to claim 4, including applicator means mounted in at least one of said outlet means for removal therefrom, said ultra-violet ray emitting means extending in interleaved and spiral convolutions from the center of said support toward the periphery thereof, said infra-red ray emitting means extending adjacent the periphery on said support.

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